



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

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CALIBRATION

Valid To: February 28, 2019

Certificate Number: 3397.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations¹:

I. Chemical

Parameter/Equipment	Range	CMC ^{2,5} (±)	Comments
Optical Emission Spectrometers ³	(0.05 to 99.9) %	See Table 1	ASTM E305 using certified reference materials in matrices including Fe, Ni, Cu, Al and Ti

II. Dimensional

Parameter/ Equipment	Range	CMC ^{2,4} (±)	Comments	
Coating Thickness Measurement Equipment ³	(1 to 2000) μin (1st layer)	3.9 %	ASTM B568 (x-ray)* *field service only	
	(1 to 2000) μin (2nd layer)	5.2 %		
	Up to 0.0015 in		3.7 %	ASTM E376 (eddy current) Zn/Fe, Cd/Fe, Cr/Fe, Ni/Fe
			3.7 %	ASTM E376 (eddy current) Cr/Cu
		3.8 %	ASTM B244 (eddy current) non-conductive/conductive	

Parameter/ Equipment	Range	CMC ^{2,4} (±)	Comments
Coating Thickness Measurement Equipment ³ (cont)	Up to 0.001 in	4.3 %	ASTM B499 (magnetic induction)
	(0.001 to 0.05) in	3.9 %	Microresistance (rate panel)
	Up to 0.1 in	5.5 %	Microresistance (Cu fine line)
	(35 to 200) μin	3.9 %	ASTM B530 (Ni/nonmagnetic)
Plated Thru-Hole Measuring Equipment ³	Up to 0.004 in	5.5 %	ASTM E376 (eddy current – ETP)
Coating Thickness Measurement Standards	Up to 0.0015 in	4.2 %	ASTM E376 (eddy current) Zn/Fe, Cd/Fe, Cr/Fe, Ni/Fe
	Up to 0.001 in	4.7 %	ASTM E376 (eddy current) Cr/Cu
	(0.001 to 0.05) in	4.7 %	ASTM B244 (eddy current) non-conductive/conductive
	Up to 0.1 in	4.7 %	ASTM B499 (magnetic induction)
	(35 to 200) μin	4.4 %	Microresistance (rate panel)
	(0.0003 to 0.0055) in	5.9 %	Microresistance (Cu fine line)
	Up to 0.0055 in	4.3 %	ASMT B530 (Ni/nonmagnetic)
Plated Thru-Hole Standards	Up to 0.004 in	5.9 %	ASTM E376 (eddy current – ETP)

¹ This laboratory offers commercial calibration service and field calibration service.

² Calibration and Measurement Capability Uncertainty (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards or nearly ideal measuring equipment. CMCs represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.

³ Field calibration service is available for this calibration and this laboratory meets A2LA R104 – *General Requirements: Accreditation of Field Testing and Field Calibration Laboratories* for these calibrations. Please note the actual measurement uncertainties achievable on a customer's site can normally be expected to be larger than the CMC found on the A2LA Scope. Allowance must be made for aspects such as the environment at the place of calibration and for other possible adverse effects such as those caused by transportation of the calibration equipment. The usual allowance for the actual uncertainty introduced by the item being calibrated, (e.g. resolution) must also be considered and this, on its own, could result in the actual measurement uncertainty achievable on a customer's site being larger than the CMC.

⁴ In the statement of CMC, the value is defined as the percentage of reading unless otherwise noted.

⁵ The notation ^w/_o is defined as weight percent.

Table 1: CMC values are in Weight Percent. The actual uncertainty associated with the calibration of the unit under test will vary depending on the element matrix involved. Uncertainty values for a specific matrix are available upon request.

Element	Concentration ⁵ (w/o)
Aluminum (Al)	0.62 %
Carbon (C)	2.5 %
Chromium (Cr)	0.88 %
Copper (Cu)	0.23 %
Iron (Fe)	1.5 %
Lead (Pb)	2.0 %
Magnesium (Mg)	2.1 %
Manganese (Mn)	1.5 %
Molybdenum (Mo)	1.3 %
Nickel (Ni)	0.19 %
Phosphorus	4.2 %
Titanium (Ti)	4.1 %
Silicon (Si)	2.0 %
Sulfur (S)	4.9 %
Tin (Sn)	0.90 %
Zinc (Zn)	1.1 %
Zirconium (Zr)	0.77 %



Accredited Laboratory

A2LA has accredited

Hitachi High-Tech Analytical Science America, Inc. (Formerly Oxford Instruments America, Inc.)

Concord, MA

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and R205 – Specific Requirements: Calibration Laboratory Accreditation Program. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).



Presented this 2nd day of February, 2017.

A handwritten signature in black ink, written over a horizontal line.

President and CEO
For the Accreditation Council
Certificate Number 3397.01
Valid to February 28, 2019

For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.